

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Claims Amendments

1. (Currently Amended) Device for carrying out gas reactions, comprising a plasma reactor with a through-flow of gases which has a plasma chamber, ~~particularly a cylindrical plasma chamber~~, wherein flow-forming elements for forming the flow of gases are arranged at a position selected from the group consisting of before, and/or in and[[/or]] after the plasma reactor in order to form a gas stream within the plasma chamber such that at least one, ~~particularly central~~, zone in the gas flow is formed which is flow-reduced, ~~characterized in that~~ wherein said flow-forming elements are arranged ~~so as~~ to be adjustable.
2. (Currently Amended) Device according to claim 1, ~~characterized in that~~ wherein the flow-forming elements arranged in the gas stream are configured as cones, drops, annular gaps, diaphragms, grids, baffle bodies, vortex tubes, cyclones or turbines.
3. (Currently Amended) Device according to ~~any one of the preceding claims, characterized in that~~ claim 1, wherein a reaction tube is arranged axially after the reactor.
4. (Currently Amended) Device according to ~~any one of the preceding claims, characterized in that~~ claim 1, wherein cooling chambers are arranged at a position selected from the group consisting of the inlet of the reactor, and/or the outlet of the reactor, and/or in and/or on the wall of the reaction tube, and on the wall of the reaction tube.

5. (Currently Amended) Device according to ~~any one of the preceding claims~~, characterized in that claim 1, wherein feed elements, ~~particularly nozzles, slots or tubes~~, are provided for introduction of cooling medium, ~~particularly cold gases, liquid substances or part of the starting materials~~.
6. (Currently Amended) Device according to claim 5, ~~characterized in that~~ wherein the feed elements form flow-forming elements.
7. (Currently Amended) Device according to ~~any one of the preceding claims~~, characterized in that claim 1, wherein catalysts are arranged in the reaction tube, ~~in particular so as to be displaceable~~, said catalysts in particular being heterogeneous catalysts on bottoms, in a basket, or as a monolith.
8. (Currently Amended) Method for carrying out gas reactions by passing a stream of gas or of gasifiable substances through a microwave-excited plasma in a plasma chamber of a plasma reactor, ~~particularly a non-equilibrium plasma, in order to convert the components, particularly~~ in a device according to ~~any one of the preceding claims~~, characterized in that claim 1, wherein by means of adjustable flow-forming elements at least one flow-reduced zone is formed in the gas stream in order to produce a stable plasma within such a zone.
9. (Currently Amended) Process according to claim 8, ~~characterized in that~~ by means of the flow-forming elements a rotation of the gas stream is achieved.
10. (Currently Amended) Process according to ~~any one of the preceding claims~~, characterized in that claim 8, wherein heat is recovered by means of a heat exchanger integrated in the reaction tube, ~~in particular by using a black exchange surface~~ for exploitation of the radiation energy.
11. (Currently Amended) Process according to ~~any one of the preceding claims~~, characterized in that claim 8, wherein gases or aerosols, ~~particularly hydrogen~~, are introduced via nozzles in

~~order~~ to control the temperature, ~~in particular in the reaction or recombination zone, and in particular in order~~ to achieve a more efficient activation after the plasma by means of the feeds
(3).

12. (Currently Amended) Process according to ~~any one of the preceding claims, characterized in that~~ claim 8, wherein the plasma is pulse-operated, ~~particularly by pulsed control of the microwave generator and/or pulsed coupling of the microwaves into the resonator, particularly at pulse frequencies from 1 Hz to 50 kHz.~~

13. (New) Device according to claim 1, wherein said plasma chamber is a cylindrical plasma chamber.

14. (New) Device according to claim 1, wherein said at least one zone is a central zone.

15. (New) Device according to claim 5, wherein said feed elements are selected from the group consisting of nozzles, slots, and tubes.

16. (New) Device according to claim, 5. wherein the cooling medium is selected from the group consisting of cold gases, liquid substances and part of the starting materials.

17. (New) Device according to claim 7, wherein the catalysts are arranged to be displaceable in the reaction tube.

18. (New) Method according to claim 8, wherein the plasma passed through the plasma chamber is non-equilibrium plasma.

19. (New) Process according to claim 10, wherein heat is recovered by means of a heat exchanger integrated in the reaction tube using a black exchange surface.

20. (New) Process according to claim 11, wherein the gases introduced to control the temperature include hydrogen.

21. (New) Process according to claim 11, wherein the gases or aerosols are introduced to control the temperature in the reactor or recombination zone.
22. (New) Process according to claim 12, wherein the stream of gas or of gasifiable substances is pulse operated by pulse control in a microwave generator.
23. (New) Process according to claim 12, wherein the plasma is passed through a resonator, and the plasma is pulse-operated by pulsed coupling of the microwaves into the resonator at pulse frequencies of from 1 Hz to 50 Hz.